

Patent Claims

1. A method of heat drilling holes into ice, comprising the steps of:
 - 5 forming a vertical pre-bore hole (9) of small diameter with a meltwash drill head;
 - positioning a melt-wash dril head (1) of larger diameter on the pre-bore hole (9);
 - heating water as a heat carrier on the surface of the ice;
 - controlled pumping under pressure of the hot water (4) into the rinse-wash
- 10 drill head;
- deflecting the hot water (4) in the range of the melt-wash drill head (1) into a radial plane (5);
- washing the hot water (4) as a sharp disk-like jet (6) circumferentially radially against the wall of the bore hole (7) whereby the hot water (4) is mixed
- 15 with the melt water (10) and pressed into the direction of the surface of the ice;
- lowering of the melt-wash drill head (1) for froming a main bore hole (19);
- and
- dissipating by seepage or pumping the hot water (4) pressed in the direction of the surface of the ice and mixed with the melt water (10).

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2. The method of claim 1,
characterized by
the water being heated to temperatures of up to 90 °C.

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3. The method of one of claims 1 or 2,
characterized by
the hot water (4) being pumped at pressures of up to the range of 10^7 Pa.

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4. The method of one of claims 1 to 3,
characterized by

a cavern being washed out with the wash water at a depth of up to 50 meters and the wash water mixed with the melt water (10) being pumped into it for dissipation by seepage.

5 5. The method of one of claims 1 to 4,
characterized by
a cylindrical guide element (29) being inserted by a cable (32) into the main bore
hole (19) in the transition range between the lower ice edge (30) and the sea
(31).

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6. An apparatus for practicing a method of heat drilling holes into ice by a
drill head heatable by hot water as well as a supply and hoisting and lowering
crane device, especially in accordance with one of claims 1 to 5,
characterized by
15 the drill head being structured as a combination melt-wash drill head (1) provided
at its upper end with an axial water input (2) and at its lower end with a
hemispherical melt section (3) as well as above the melt section (3) but below
the water input (2) with a narrow azimuthally circumferential annual gap (5)
connected to the water input (2) as the water output, the entire melt-wash drill
20 head (1) being formed of a material of good heat conductivity.

7. The apparatus of claim 6,
characterized by
the azimuthally circumferential annular gap (5) being of a width in the range of a
25 millimeter.

8. The apparatus of claim 6 or 7,
characterized by
the material of good heat conductivity being copper.

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9. The apparatus of one of claims 6 to 8,
characterized by
the melt-wash drill head (1) being hollow in the range below the annular gap (5)
and a plurality of radial vanes (24) being connected with the annular gap (5) by
5 large surfaces.

10. The apparatus of one of claims 6 to 9,
characterized by
the melt-wash drill head (1) being constructed of a plurality of hydraulically tightly
10 clamped together radial layers (25).

11. The apparatus of one of claims 6 to 10,
characterized by
a hose (17) for feeding the hot water (4) to the axial water input (4) and a cable
15 for hoisting and lowering the melt-wash drill head (1) form a unit.

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